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10/092,517	03/08/2002	Takafumi Noguchi	Q66506	3791

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Washington, DC 20037-3213

EXAMINER

LAM, HUNG H

ART UNIT	PAPER NUMBER
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2622

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01/11/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/092,517

Applicant(s)

NOGUCHI, TAKAFUMI

Examiner

Hung H. Lam

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☒ Claim(s) 19-24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/01/07 has been entered.

Response to Amendment

2. The amendments, filed on 11/01/07, have been entered and made of record. Claims 19-24 are added. Claims 1-24 are pending.

Response to Arguments

3. Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inai et al. (US-4,437,111) in view of Konishi (US-4,774,564) and further in view of Fujiwara (US-6,643,399).

Regarding **claim 1**, Inai et al. disclose an image capturing method in which an image of a subject is captured by an image capturing device using image capturing optics (Fig. 3, optical lens 1-4; col. 2, lines 22-28) and an image capturing signal from said image capturing device (5) is subjected to specified processing schemes including a color separating process (Fig. 3, Y color separator process 7-11; col. 2, lines 39-51), thereby producing an image signal, said method comprising the steps of:

determining whether sensitivity of said image capturing device is insufficient or not during image capturing (Fig. 3, brightness detector 13, brightness determining circuit 14; col. 2, lines 51-67);

when the sensitivity of said image capturing device is insufficient, relatively increasing at least one of an overlapping region of spectral sensitivity of said image capturing device (col. 4, lines 50-61; when brightness is below the set level, infrared filter is removed to increase the sensitivity of the pickup-tube);

when the sensitivity of said image capturing device is sufficient, relatively decreasing at least one of the overlapping region of the spectral sensitivity of said image capturing device (col. 4, lines 38-49; when brightness is above the set level, infrared filter is inserted to decrease the sensitivity of the pickup-tube).

However, Inai et al. fail to disclose that when the brightness is below or above the set level, the corresponding intensity of color separating process is increased or decreased.

In the same field of endeavor, Konishi teaches an electronic still camera wherein the intensity of the RGB/color separating process is set to a predetermined level if it is possible (Figs. 6 and 7) or disengaged and continued in manual mode (col. 13, lines 47-53). Konishi further teaches that the gains of the G and B signals of the color separating process are increased when color temperature detects low light; otherwise, the system is disengaged to complete the photographing in manual mode (col. 13, lines 30-55). In addition, Konishi teaches that the gain of the color separation and gain adjustment unit 50 are adjusted on the basis of the color temperature data obtained by color temperature sensor 78 and the incident light volume or quantity from the scene obtained from photosensitive device 36 (Col. 11, Ln. 28-42; it is noted that by adjusting the gain, the intensity of the color separation unit must be increased or decreased. Also on the basis of information sent by the color temperature sensor 78 and sensor 36, the main control 58 must determine the sufficiency / insufficiency of the sensitivity of the image capturing device for adjusting the gain of the color separation unit 50 accordingly). In light of the teaching from Konishi, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Inai to increase or decrease the gain (intensity) of the color separating process as taught by Konishi and thus controlling the gain-variable of the color separation in accordance to the data obtained by the color temperature sensor/ photo sensitive device (Konishi, col. 3, lines 47-53).

Inai in view of Konishi teaches the relatively increasing or decreasing the intensity of said color separating process (Konishi: Col. 11, Ln. 28-Col. 13, Ln 55). However, Inai in view of

Konishi fails to disclose wherein, when relatively increasing or decreasing the intensity of said color separating process, an occurrence of noise generation is not thereby increased during color separation.

In the same field of endeavor, Fujiwara teaches a color processing circuit that removes noise by applying under color removal process (Col. 3, Ln. 62-Col. 4, Ln. 25). In light of the teaching from Fujiwara, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Inai and Konishi to include a color processing circuit as taught by Fujiwara in order to perform noise removal operation by applying under color removal process. The modifications thus improve the image quality.

Regarding **claim 4**, all limitations are contained in claim 1. See the rejection of claim 1 above.

6. Claims 1-13, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inai et al. (US-4,437,111) in view of Konishi (US-4,774,564) and further in view of Kojima (US-5,426,469).

Regarding **claim 1**, Inai et al. disclose an image capturing method in which an image of a subject is captured by an image capturing device using image capturing optics (Fig. 3, optical lens 1-4; col. 2, lines 22-28) and an image capturing signal from said image capturing device (5) is subjected to specified processing schemes including a color separating process (Fig. 3, Y

Art Unit: 2622

color separator process 7-11; col. 2, lines 39-51), thereby producing an image signal, said method comprising the steps of:

determining whether sensitivity of said image capturing device is insufficient or not during image capturing (Fig. 3, brightness detector 13, brightness determining circuit 14; col. 2, lines 51-67);

when the sensitivity of said image capturing device is insufficient, relatively increasing at least one of an overlapping region of spectral sensitivity of said image capturing device (col. 4, lines 50-61; when brightness is below the set level, infrared filter is removed to increase the sensitivity of the pickup-tube);

when the sensitivity of said image capturing device is sufficient, relatively decreasing at least one of the overlapping region of the spectral sensitivity of said image capturing device (col. 4, lines 38-49; when brightness is above the set level, infrared filter is inserted to decrease the sensitivity of the pickup-tube).

However, Inai et al. fail to disclose that when the brightness is below or above the set level, the corresponding intensity of color separating process is increased or decreased.

In the same field of endeavor, Konishi teaches an electronic still camera wherein the intensity of the RGB/color separating process is set to a predetermined level if it is possible (Figs. 6 and 7) or disengaged and continued in manual mode (col. 13, lines 47-53). Konishi further teaches that the gains of the G and B signals of the color separating process are increased when color temperature detects low light; otherwise, the system is disengaged to complete the photographing in manual mode (col. 13, lines 30-55). In addition, Konishi teaches that the gain of the color separation and gain adjustment unit 50 are adjusted on the basis of the color

Art Unit: 2622

temperature data obtained by color temperature sensor 78 and the incident light volume or quantity from the scene obtained from photosensitive device 36 (Col. 11, Ln. 28-42; it is noted that by adjusting the gain, the intensity of the color separation unit must be increased or decreased. Also on the basis of information sent by the color temperature sensor 78 and sensor 36, the main control 58 must determine the sufficiency / insufficiency of the sensitivity of the image capturing device for adjusting the gain of the color separation unit 50 accordingly). In light of the teaching from Konishi, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Inai to increase or decrease the gain (intensity) of the color separating process as taught by Konishi and thus controlling the gain-variable of the color separation in accordance to the data obtained by the color temperature sensor/ photo sensitive device (Konishi, col. 3, lines 47-53).

Inai in view of Konishi teaches the relatively increasing or decreasing the intensity of said color separating process (Konishi: Col. 11, Ln. 28-Col. 13, Ln 55). However, Inai in view of Konishi fails to disclose wherein, when relatively increasing or decreasing the intensity of said color separating process, an occurrence of noise generation is not thereby increased during color separation.

In the same field of endeavor, Kojima teaches a video processor circuit that separates a color signal from a luminance signal and removes the noise components from the luminance signal by a predetermined operation (abstract; Col. 1, Ln. 14-18; Col. 8, Ln. 26-61). In light of the teaching from Kojima, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Inai and Konishi to include a video color

processor as taught by Kojima in order to separate color signal and noise components from a luminance signal. The modifications thus improve the image quality.

Regarding **claim 2**, Inai in view of Konishi and further in view of Kojima discloses the image capturing method wherein the overlapping region of the spectral sensitivity of said image capturing device is an infrared region (Inai, Fig. 3, Infrared Filter 3; col. 3, lines 1-12; the spectral sensitivity of the image capturing device is adjusted by inserting or removing the infrared filter).

Regarding **claim 3**, Inai in view of Konishi and further in view of Kojima fails to explicitly disclose that the color separating process is an under color removal scheme.

Official Notice is taken that it is well known and expected in the art that a color separating default condition includes a color removal process. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was to modify the device of Inai, Konishi and Kojima to include an under color removal scheme in a color separating process in order to secure gradation and eliminate mosquito noise generation. The modifications thus provide better image-data.

Regarding **claim 4**, all limitations are contained in claim 1. See the rejection of claim 1 above.

Regarding **claim 5**, all limitations are contained in claim 2. See the rejection of claim 2 above.

Regarding **claim 6**, all limitations are contained in claim 3. See the rejection of claim 3 above.

Regarding **claim 7**, Inai in view of Konishi and further in view of Kojima discloses the image capturing apparatus, wherein after the image capturing device (Konishi: Fig. 1; CCD 22) captures the image of a subject the image is converted to exposure data and the exposure data is subjected to color separation (Konishi: see Fig. 1; CCD 22 inherently captures an image and converts the exposure data to RGB signal which is then sent and subjected to the color separation unit 50).

Regarding **claims 8 and 9**, all limitations are contained in claim 1. See the rejection of claim 1 above.

Regarding **claim 10**, Inai in view of Konishi and further in view of Kojima discloses the image capturing apparatus, wherein said device for producing the image signal by performing specified processing schemes does not generate noise (Kojima: abstract; Col. 1, Ln. 14-18; Col. 8, Ln. 26-61).

Regarding **claim 11**, Inai in view of Konishi and further in view of Kojima discloses the image capturing apparatus wherein said image capturing apparatus (Konishi: see the camera in Fig. 1) comprises a device (Konishi: Fig. 3; AE control 66 and shutter drive 40) for maintaining a consistent aperture (Konishi: Fig. 3; Col. 6, Ln. 66 - Col. 7, Ln. 7-18; AE control 66

inherently controls a consistent aperture in accordance with a light intensity measured at the photosensitive element 36).

Regarding **claim 12** Inai in view of Konishi and further in view of Kojima discloses the image capturing apparatus, wherein said image capturing apparatus comprises a device (Konishi: Fig. 3; AE control 66 and diaphragm drive 28) for maintaining a consistent shutter speed (Konishi: Fig. 3; Col. 7, Ln. 7-18; AE control 66 inherently controls a consistent shutter / diaphragm speed in accordance with a light intensity measured at the photosensitive element 36).

Regarding **claim 13**, Inai in view of Konishi and further in view of Kojima discloses the image capturing apparatus wherein said sensitivity is based on a spectral response of said image capturing device (see Inai: Col. 1, Ln. 10-22 wherein the sensitivity spectrum of recent high sensitivity image pickup devices have considerable sensitivities in the infrared range of about 700-830 nm as shown in Fig. 1; see Col. 2, Ln. 50- Col. 3, Ln. 11 wherein the infrared filter is inserted to delete infrared component on the basic of a predetermined high brightness level which the sensitivity spectrum of curve b, c and d in Fig. 1 approaches the cutoff maximum sensitivity $\mu\text{A}/\mu\text{W}$).

Regarding **claim 14**, Inai in view of Konishi and further in view of Kojima discloses the image capturing method wherein the process of increasing the intensity itself does not increase the occurrence of noise (Kojima: abstract; Col. 1, Ln. 14-18; Col. 8, Ln. 26-61).

Regarding **claim 16**, Inai in view of Konishi and further in view of Kojima discloses the image capturing method further comprising capturing a still image (Konishi: abstract; Col. 3, Ln. 61-Col. 4, Ln. 58; Col. 9, Ln. 1-18).

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inai et al. in view of Konishi, in view of Kojima and further in view of Nagata (US-5,091,743).

Regarding **claim 15**, Inai in view of Konishi and further in view of Kojima fails to explicitly disclose the image capturing method wherein amplification is not required to increase the intensity of said color separating process.

In the same field of endeavor, Nagata teaches an imaging device wherein a yellow color intensity is intended to be increased by plus one level, a yellow filter insertion amount L1 is increased by "1". If a red color intensity is intended to be increased by plus two level, insertion amount L1 and L2 of a red color filter and magenta filters are respectively increased by "1" (Col. 17, Ln. 64 - Col. 18, Ln. 17). In light of the teaching from Nagata, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Inai, Konishi and Kojima to include a color filter insertion circuit as taught by Nagata in order to increase the color intensity. The modifications thus provide an alternative method of increasing color intensity and reduce power consumption.

8. Claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inai et al. in view of Konishi, in view of Kojima and further in view of Kubo (US-7,057,653).

Regarding **claim 17**, Inai in view of Konishi and further in view of Kojima fails to disclose the image capturing method, further comprising:

converting the image capturing signal into exposure data; and

adjusting the coefficients of the exposure data to perform said color separating process,

In the same field of endeavor, Kubo teaches an imaging device having an image processing (Fig. 2; 12); wherein a pixel interpolation section (13) of the image processing (12) is subjected to a masking process on an image data (31; image data 31 is interpreted as exposure data) according to different filter patterns so that every one of R, G and B pixels are separated into color data 32, 34 and 36 (Figs. 2, 7-9; Col. 10, Ln. 53-Col. 11, Ln. 32; the masking and interpolation process in the interpolation section 13 inherently manipulate or adjust the exposure data in order to provide separate colors output 33, 35 and 37 as shown in Fig. 7). Kubo further teaches that the RGB pixel interpolation process speed "a", "b" and "c" can be set in according with capture image size and image compression mode (Col. 12, Ln. 15-55). Kubo teaches that by improving the image processing speed with regarding, in particular, to image capturing attaching less importance to the image quality, an increased number of image frames can be captured per unit time (Col. 12, Ln. 57-60). In light of the teaching from Kubo, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Inai, Konishi and Kojima to include the image processing of Kubo in order to perform a masking process so as to separate every one of R, G and B pixels into color data 32, 34 and 36. The modifications thus provide a variety of interpolation speed and increase the number of image frames captured per unit time (Kubo: Col. 12, Ln. 31-60).

Regarding **claim 18**, Inai in view of Konishi and further in view of Kojima fails to disclose the image capturing method, wherein the color separating process is a masking process.

In the same field of endeavor, Kubo teaches an imaging device having an image processing (Fig. 2; 12); wherein a pixel interpolation section (13) of the image processing (12) is subjected to a masking process on an image data (31; image data 31 is interpreted as exposure data) according to different filter patterns so that every one of R, G and B pixels are separated into color data 32, 34 and 36 (Figs. 2, 7-9; Col. 10, Ln. 53-Col. 11, Ln. 32). Kubo further teaches that the RGB pixel interpolation process speed “a”, “b” and “c” can be set in according with capture image size and image compression mode (Col. 12, Ln. 15-55). Kubo teaches that by improving the image processing speed with regarding, in particular, to image capturing attaching less importance to the image quality, an increased number of image frames can be captured per unit time (Col. 12, Ln. 57-60). In light of the teaching from Kubo, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Inai, Konishi and Kojima to include the image processing of Kubo in order to perform a masking process so as to separate every one of R, G and B pixels into color data 32, 34 and 36. The modifications thus provide a variety of interpolation speed and increase the number of image frames captured per unit time (Kubo: Col. 12, Ln. 31-60).

Allowable Subject Matter

Art Unit: 2622

9. Claims 19 and 22 are objected to as being dependent upon a rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With regarding to **claim 19**, the following is a statement of reason for the indication of allowance: the prior art made of record and considered pertinent to the applicant's disclosure does not disclose nor fairly suggest an image capturing method of claim 1 further in combination with: **wherein said image capturing optics includes an IR cutting filter for cutting off infrared light, when said sensitivity of said image capturing device is insufficient, said IR cutting filter is removed from said image capturing optical path of said image capturing optics, and thereafter said image of the subject is captured by said image capturing device, and**

when said sensitivity of said image capturing device is sufficient, said IR cutting filter is arranged into said image capturing optical path, and thereafter said image of the subject is captured by said image capturing device, and

wherein said intensity of said color separating process is determined adaptively by comparing two kinds of image data, one being first capturing image data obtained by capturing said image of the subject with said IR cutting filter inserted in said image capturing optical path and the other being second capturing image data obtained by capturing said image of the subject when said IR cutting filter is removed from said image capturing optical path.

With regarding to **claim 22**, the following is a statement of reason for the indication of allowance: the prior art made of record and considered pertinent to the applicant's disclosure does not disclose nor fairly suggest an image capturing apparatus of claim 4 further in combination: **wherein said image capturing optics includes an IR cutting filter for cutting off infrared light and an IR cutting filter removing device for removing said IR cutting filter from said image capturing optical path of said image capturing optics and arranging said IR cutting filter into said image capturing optical path, when said sensitivity of said image capturing device is insufficient, said IR cutting filter is removed from said image capturing optical path by said IR cutting filter removing device, and thereafter said image of the subject is captured by said image capturing device, and**

when said sensitivity of said image capturing device is sufficient, said IR cutting filter is arranged into said image capturing optical path by said IR cutting filter removing device, and thereafter said image of the subject is captured by said image capturing device, and

wherein said intensity of said color separating process is determined adaptively by comparing two kinds of image data, one being first capturing image data obtained by capturing said image of the subject with said IR cutting filter inserted in said image capturing optical path and the other being second capturing image data obtained by capturing said image of the subject when said IR cutting filter is removed from said image capturing optical path.

With regarding to **claims 20-21 and 23-24**, the claims are objected as being dependent on claims 19 and 22, respectively.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Acharya (US-6,229,578) discloses a color planes having color separated and noise removal .

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung H. Lam whose telephone number is 571-272-7367. The examiner can normally be reached on Monday - Friday 8AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, LIN YE can be reached on 571-272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

Art Unit: 2622

system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HL

01/05/08



LIN YE
SUPERVISORY PATENT EXAMINER